

## APPENDIX A CLAIMS (STATUS)

1. (Currently amended) An energy passing aperture member positioned in a structure that is relatively opaque to the passage of said energy, said aperture of said structure comprising in combination: a membrane layer of crystalline material which is 1 to 10 micrometers in thickness having first and second essentially parallel surfaces, said membrane layer having a first doping level, and being doped with boron to about  $7 \times 10^{19}$  atoms/cm<sup>3</sup>, said first surface of said membrane layer being a continuous energy entrant surface, a frame member of said crystalline material which is 625 micrometers in thickness, said frame member having a second doping level and being doped to  $10^{16}$  atoms/cm<sup>3</sup>, said frame member forming epitaxial supporting contact with said second surface of said membrane layer surrounding an unsupported area of said second surface of said membrane layer and, at least one opening extending through said membrane layer from said first surface to said second surface, said at least one opening being positioned in said unsupported area of said second surface of said membrane layer, said membrane layer of crystalline material having an etch responsiveness different from a bulk etch responsiveness of said epitaxially joined frame member.
2. (Canceled) The energy passing aperture of claim 1 wherein said first doping level is higher than said second doping level.
3. (Original) The energy passing aperture of claim 1 wherein said structure is a semiconductor wafer having first and second essentially parallel surfaces.
4. (Original) The energy passing aperture of claim 3 wherein said first surface of said wafer is said continuous energy entrant first surface of said membrane layer.

5. (Original) The energy passing aperture of claim 3 wherein said crystalline material is silicon.

6. (Original) The energy passing aperture of claim 5 wherein said doping level of said membrane layer operates to stop an etch taking place with respect to said frame member.

7. (Canceled) The energy passing aperture of claim 6 wherein the doping in said doping level of said membrane layer is boron.

8. (Currently amended) In the fabrication of an energy passing aperture structure, a process comprising:

providing a quantity of crystalline material,

arranging for a layer in said quantity of crystalline material to serve ~~with~~ as a first surface thereof as the energy entrant portion of said structure,

the material of said layer having a thickness of about 1 to 10 micrometers for service as a membrane, the material of said layer having a first etch responsiveness,

arranging a quantity of crystalline material to serve as the support portion of said structure,

said support portion of said material having a second responsiveness to etching, said difference in etch responsiveness being produced by a difference in doping, wherein said membrane layer is doped to  $7 \times 10^{19}$  atoms/cm<sup>3</sup> and said support portion is doped to about  $10^{16}$  atoms/cm<sup>3</sup>,

said support portion being shaped by etching into forming an unsupported membrane area of said layer surrounded by a continuous epitaxial contact with the remaining surface of said layer, using said difference between said first and said second etch responsiveness to serve as an etch stop at said layer in said shaping of said support portion, and forming an opening through said unsupported membrane area.

9. (Canceled) The process of claim 8 wherein said thickness of said material for service as a membrane is about 1 to 10 micrometers.

10. (Canceled) The process of claim 9 wherein said difference in etch responsiveness is produced by a difference in doping.
11. (Original) The process of claim 8 wherein, in said step of providing a quantity of crystalline material, said quantity is in wafer form.
12. (Original) The process of claim 11 wherein said crystalline material is silicon.
13. (Canceled) The process of claim 12 wherein in said membrane layer is doped with boron to  $7 \times 10^{19}$  atoms/cm<sup>3</sup>.
14. (Canceled) The process of claim 13 wherein said difference in etch responsiveness is produced by a difference in doping.
15. (Canceled) The process of claim 14 wherein the difference in etch responsiveness is produced by a difference in doping wherein said membrane layer is doped to  $7 \times 10^{19}$  atoms/cm<sup>3</sup> and said support portion is doped to about  $10^{16}$  atoms/cm<sup>3</sup>.

16. (New) A process for the fabrication of an energy passing aperture structure comprising:  
forming a treated silicon wafer by coating a silicon wafer with a silicon etch stop selected from the group consisting of silicon oxide or silicon nitride;  
 patterning a through-hole alignment pattern of said wafer using lithographic techniques to form a photoresist;  
 transferring said photoresist pattern through said etch stop to silicon using an etch method selected from the group consisting of hydrofluoric acid etching or reactive ion etching;  
 etching said silicon to form open through-holes from front to back of said wafer using potassium hydroxide silicon etchant;  
 stripping said photoresist using means consisting of a solvent or ion asher;  
 strip said etch stop using an etch method selected from the group consisting of hydrofluoric acid etching or reactive ion etching;  
 said treated silicon wafer having an above side and a below side;  
 doping said above side and said below side of said wafer to produce a 5 micrometer layer of silicon doped with boron to about  $7 \times 10^{19}$  atoms/cm<sup>3</sup> using a technique selected from the group consisting of implant or diffusion;  
 patterning the below side of said wafer with a window pattern using lithographic techniques to form a photoresist;  
 reactive ion etching said below side through said 5 micrometer layer of silicon doped with boron to about  $7 \times 10^{19}$  atoms/cm<sup>3</sup> into said silicon;  
 stripping said photoresist on said below side using means selected from the group consisting of a solvent or ion asher;  
 patterning said above side of said wafer with an aperture pattern using lithographic techniques to form a photoresist;  
 reactive ion etching said above side through said 5 micrometer layer of silicon doped with boron to about  $7 \times 10^{19}$  atoms/cm<sup>3</sup> into said silicon;  
 stripping said photoresist on said above side using means selected from the group consisting of a solvent or ion asher;  
 etching said silicon wafer to form open through-holes from front to back of said wafer using a silicon etchant selected from the group consisting of potassium hyrdioxide and ethylene diamine/pyrocatechol/water blend that is compatible with boron diffused silicon which boron diffused silicon serves as an etch stop, and continuing said etching process until crystalline membranes are formed.

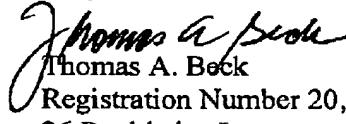
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content of the prior art. That is, the Yahiro and Katakura methods (processes) are NOT step-by-step identical to Applicants' invention. (See, e.g., Yahiro: [0036] where "...subsequently both surfaces of the substrate are oxidized thermally..."). Thermal oxidation must have an effect on the prior art substrates or the inventors would not have done it. Applicants respectfully direct the Examiner's attention to 37 C.F.R. 1.104(d)(2) which states "...When a rejection in an application is based on facts within the personal knowledge of an employee of the Office, the data shall be as specific as possible, and the reference must be supported, when called for by the applicant, by the affidavit of such employee, and such affidavit shall be subject to contradiction or explanation by the affidavits of the applicant and other persons..." Applicants submit that the Examiner should comply with the excerpt of 37 CFR 104 cited above and provide the required documentation (either prior art or personal) which would support the Examiner's assertion as to the epitaxial nature of the prior art layers as related to Applicants' invention.

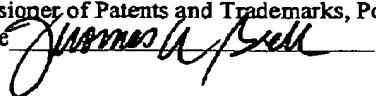
Applicants hereby request a one month extension of time within which to respond to the Official Action dated November 4, 2004\*. The Commissioner is authorized to charge Deposit Account 02/1651 in the amount of \$110.00 cover the extension fee. An extra copy of this authorization is enclosed.

The Examiner is requested to allow this case as a result of the amendments to and cancellations of the claims.

Respectfully Submitted,

  
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I hereby certify that this paper is being telefaxed on the date indicated below to (703) 872-9306 addressed to the Commissioner of Patents and Trademarks, Post Office Box 1450, Alexandria, VA 22313-1450  
Signature  Date: March 4, 2005